

Advanced Lithium Sulfur Battery, Phase I

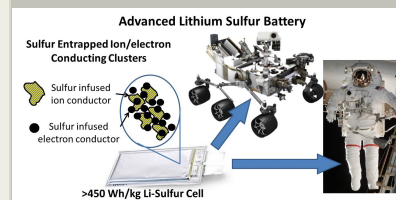
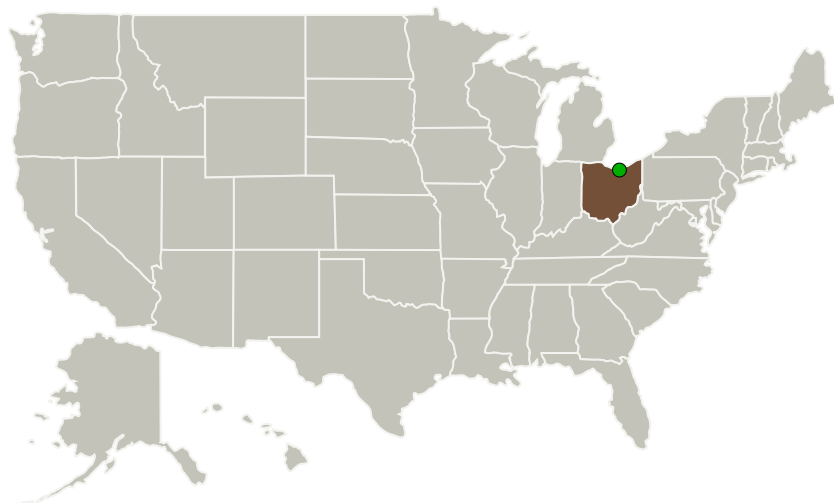
Completed Technology Project (2016 - 2016)



Project Introduction

CRG proposes to develop an Advanced Lithium Sulfur Battery (LSB) based on combining a novel super ion conducting ceramic electrolyte, entrapped sulfur cathode, and a lithium metal anode necessary to meet NASA's needs for high energy density, rechargeable, and safe energy storage. These new materials for LSBs will build upon a proven ceramic electrolyte for rechargeable lithium metal batteries. A composition of a metallic lithium anode, ceramic electrolyte, and a novel sulfur cathode will be optimized to achieve program goals for energy density, operational temperatures, storage, and cycle life. Supporting the Human Exploration and Operations Directorate, this project's technologies directly address requirements for high energy density space batteries for space exploration systems including rovers, landers, ascent vehicle space craft. This project's technologies offer high energy density (>450 Whr/kg), long storage life, and long operational life batteries. These advancements will enable space power supplies to keep pace with increasing electricity demands, and reduce battery weight by 50% while advancing the state of the art battery technology.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Completed Technology Project (2016 - 2016)



Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Ohio

Project Transitions

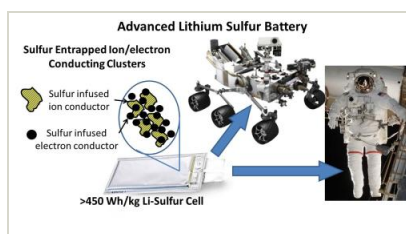
▶ **June 2016:** Project Start

✓ **December 2016:** Closed out

Closeout Documentation:

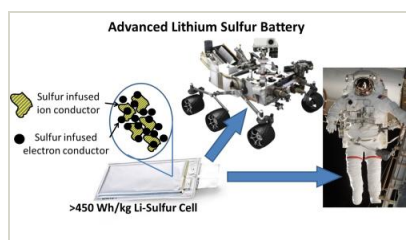
- Final Summary Chart(<https://techport.nasa.gov/file/139748>)

Images



Briefing Chart Image

Advanced Lithium Sulfur Battery, Phase I
(<https://techport.nasa.gov/image/130898>)



Final Summary Chart Image

Advanced Lithium Sulfur Battery, Phase I Project Image
(<https://techport.nasa.gov/image/130491>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cornerstone Research Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

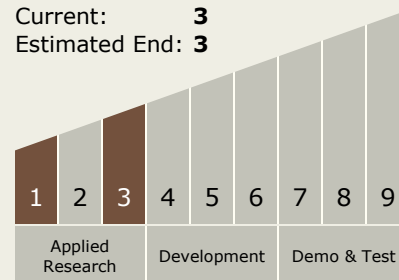
Brian E Henslee

Technology Maturity (TRL)

Start: **1**

Current: **3**

Estimated End: **3**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.1 Electrochemical: Batteries

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System